

DRAFT

ENVIRONMENTAL ASSESSMENT

OF THE PROPOSED INSTALLATION AND OPERATION OF A

COMBINED HEAT AND POWER PLANT

UNITED STATES DEPARTMENT OF

VETERANS AFFAIRS MEDICAL CENTER

MANCHESTER CAMPUS

MANCHESTER, NEW HAMPSHIRE

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Department of Veterans Affairs

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ENVIRONMENTAL ASSESSMENT SIGNATURE PAGE

LEAD AGENCY: Department of Veterans Affairs (VA)
COOPERATING AGENCIES: None
TITLE OF PROPOSED ACTION: Proposed Combined Heat and Power (CHP) Plant at the Veterans Affairs Medical Center (VAMC) Manchester Campus
AFFECTED JURISDICTION: VAMC Manchester Campus, City of Manchester, Hillsborough County, New Hampshire
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ABSTRACT: This Draft Environmental Assessment (EA) evaluates the Proposed Action of the Department of Veterans Affairs (VA) to install and operate a natural gas-fired Combined Heat and Power (CHP) plant at the VA Medical Center (VAMC) Manchester Campus. Ancillary components include, but are not limited to, removal of the existing Boiler #2 in Building 7 and interior modifications to accommodate the new CHP system. The VAMC Manchester Campus includes approximately 32 acres at 718 Smyth Road in the City of Manchester, Hillsborough County, New Hampshire.

This EA discusses two alternatives: (1) the *Preferred Action Alternative* - Implement the construction and operation of the proposed CHP plant and its ancillary components; and (2) the *No Action Alternative*. The EA evaluates possible effects to: aesthetics; air quality/greenhouse gases (GHGs); biological resources (vegetation, wildlife, and threatened and endangered species); community services; utilities; cultural resources; floodplains and wetlands; water resources (watersheds, rivers, lakes, coastal zones, hydrology, and water quality); geology, topography and soils; land use; the noise environment; socioeconomics (economy, population, housing, employment, Environmental Justice (Executive Order [EO] 12898), Protection of Children (EO 13045), and emergency services); transportation and parking; and solid and hazardous waste.

This EA concludes there would be no significant adverse impact, either individually or cumulatively, to the local environment or quality of life associated with implementing the Preferred Action Alternative, provided the mitigation measures specified in this EA are implemented. This EA concludes that a mitigated Finding of No Significant Impact is appropriate for implementation of the Preferred Action Alternative, and that an Environmental Impact Statement is not required.

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LIST OF ACRONYMS AND ABBREVIATIONS

APE	Area of Potential Effect	NHDES	New Hampshire Department of Environmental Services
AQCR	Air Quality Control Region	NHPA	National Historic Preservation Act
AST	aboveground storage tank	NO _x	nitrogen Oxides
BACT	Best Available Control Technology	NPDES	National Pollution Discharge Elimination System
BMP	best management practice	NRHP	National Register of Historic Places
BTU	British thermal unit	NSPS	New Source Performance Standards
C	Celsius	NSR	New Source Review
CAA	Clean Air Act	O ₃	ozone
CEQ	Council on Environmental Quality	OTR	O ₃ Transport Region
CFR	Code of Federal Regulations	PM	particulate matter
CHP	Combined Heat and Power	PM ₁₀	Particulate matter less than or equal to 10 micrometers in aerodynamic size
CO	carbon monoxide	PM _{2.5}	Particulate matter less than or equal to 2.5 micrometers in aerodynamic size
dB	decibel	ppm	parts per million
dbA	A-weighted decibel	PSD	Prevention of Significant Deterioration
DHR	Division of Historical Resources	PSNH	Public Services of New Hampshire Company
DNL	Day-Night Level	psig	pounds per square inch gauge
EA	Environmental Assessment	RICE	Reciprocating Internal Combustion Engine
EISA	Energy Independence and Security Act of 2007	ROI	Region of Influence
Env-A	New Hampshire Air Program Rules	SCR	Selective Catalytic Reduction
EO	Executive Order	SHPO	State Historic Preservation Officer
F	Fahrenheit	SIP	State Implementation Plan
FONSI	Finding of No Significant Impact	SME	Subject Matter Expert
FY	Fiscal Year	SO ₂	sulfur dioxide
GHG	Greenhouse Gas	TPY	tons per year
HDC	Historic Documentation Company, Inc.	µg/m ³	micrograms per cubic meter
HHW	heating hot water	USC	United States Code
HRSG	Heat Recovery Steam Generator	UST	underground storage tank
Hz	Hertz	USEPA	United States Environmental Protection Agency
IICEP	Interagency and Intergovernmental Coordination for Environmental Planning	USFWS	United States Fish and Wildlife Service
kg	kilogram	VA	Department of Veterans Affairs
klb/hr	thousand pounds per hour	VAMC	Veterans Affairs Medical Center
kW	kilowatt	VOC	volatile organic compound
kWe	kilowatt electrical		
kWh	kilowatt-hour		
L _{eq}	equivalent sound level		
MMBtu	million British thermal units		
mtpy	metric tons per year		
NAAQS	National Ambient Air Quality Standards		
NAGPRA	Native American Graves Protection and Repatriation Act		
NEPA	National Environmental Policy Act of 1969		
NESHAP	National Emission Standards for Hazardous Air Pollutants		

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SECTION 1: PURPOSE OF AND NEED FOR THE PROPOSED ACTION

1.1 Introduction

This Section provides the reader with necessary introductory and background information concerning the Proposed Action for proper analytical context; identifies the purpose of and need for the Proposed Action and the Federal decision to be made; and provides a summary of public and agency involvement (and key issues identified).

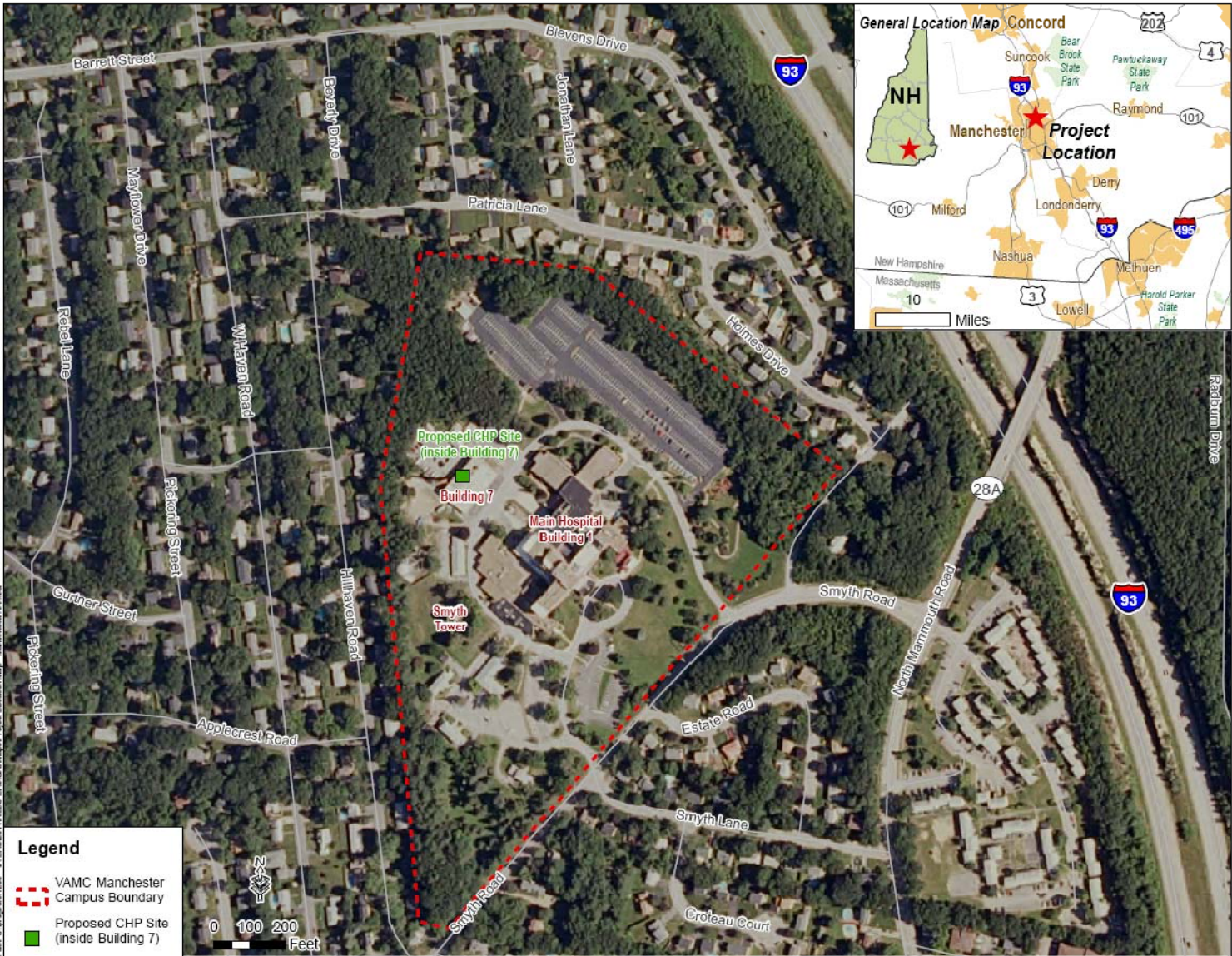
1.2 Background

The United States Department of Veterans Affairs (VA), a Federal agency, currently owns and operates the approximately 32-acre Veterans Affairs Medical Center (VAMC), Manchester Campus, located at 718 Smyth Road, Manchester, New Hampshire (see Figure 1). The Manchester Campus (hereafter referred to as "Facility") is a 276,000 square-foot, 52-bed medical center campus, part of the VA New England Healthcare System, and provides a range of medical services such as urgent care, primary care, ambulatory services, a specialty clinic, a mental health clinic, a community acute hospital based home care, and long term care.

Construction of the Facility began in the late 1940s and operation began on July 2, 1950. This Facility has historic significance since it includes the Smyth Tower, which was built around 1888 and was used by Late Governor Fredrick Smyth as a hideaway retreat. In addition to the Smyth Tower, the Facility is comprised of the main medical center (Building 1), resident quarters, National Guard offices, research service center, the boiler plant (Building 7), primary care building and other associated buildings. Building 1, the main medical center, is an 8-story, approximately 166,000 square-foot building constructed between 1948 and 1950. This building houses outpatient and mental health services, and specialty clinics. One building houses the Community Living Center. In the late 1990s, Facility operations changed from a 24-hour hospital facility to a Medical Center that operates normal business hours Monday – Friday, with the clinics open during select weekends.

As a result of population growth within the Manchester region, the area around the Facility is completely built out and is now considered a dense residential area. Figure 1 depicts an aerial view of the Facility along with the location of the proposed combined heat and power (CHP) plant.

Figure 1: Manchester Campus Site Location



The Federal government has passed legislation and provided directives to Federal agencies, such as the VA, that require these agencies to reduce energy use, reduce reliance on traditional fossil fuel-based energy sources, and increase the use of renewable energy sources at their facilities. Renewable energy sources include wind, solar, geothermal, biomass (i.e., non-fossil fuel energy sources), and other sustainable methods. The following provides a brief summary of these Federal requirements to which the VA is subject:

- In 2005, Congress passed the **Energy Policy Act**. Section 203 of this Act requires that, of the total amount of electric energy the Federal government consumes during any fiscal year (FY), specific amounts shall be from renewable energy sources. Section 203 of the Energy Policy Act specifically requires that, for FYs 2010 through 2012, not less than 5 percent of the Federal agency's consumed energy must be renewable in nature. In addition, the Act specifies that, "For the purposes of determining compliance, the amount of renewable energy saved shall be doubled if: (a) The renewable energy is produced and used *onsite* at a Federal facility; (b) The renewable energy is produced on Federal lands and is used at a Federal facility; or (c) The renewable energy is produced on Indian land and used at a Federal facility."
- **Executive Order (EO) 13423**, *Strengthening Environmental, Energy, and Transportation Management* (24 January 2007), sets goals for the head of each Federal agency with regard to environmental and energy management. This EO requires that Federal agencies conduct their environmental, transportation, and energy-related activities under the law in support of their respective missions in an environmentally, economically, and fiscally sound, integrated, continuously improving, efficient, and sustainable manner. Specifically, according to EO 13423, Federal agencies are to, among other measures: (a) Improve energy efficiency and reduce greenhouse gas (GHG) emissions of the agency through a reduction of energy usage by 3 percent annually, or by 30 percent by the end of FY 2015, relative to the baseline of the agency's energy use in FY 2003; (b) Ensure that at least half of the statutorily required renewable energy consumed by the agency in any FY comes from new renewable sources (and, to the extent feasible, the agency implements renewable energy generation projects *on agency property for agency use*); and (c) Beginning in FY 2008, reduce water consumption intensity, relative to the baseline of the agency's water consumption in FY 2007, through life-cycle cost-effective measures by 2 percent annually through the end of FY 2015, or 16 percent by the end of FY 2015.
- **EO 13514**, *Federal Leadership in Environmental, Energy, and Economic Performance* (5 October 2009), sets Federal energy requirements in several areas, including: Accountability and Transparency, Strategic Sustainability, Performance Planning, GHG Management, Sustainable Buildings and Communities, Water Efficiency, Electronic Products and Services, Fleet and Transportation Management, and Pollution Prevention and Waste Reduction. This EO states that all Federal agencies are to increase use of renewable energy and implement renewable energy generation projects on Federal property.
- The **Energy Independence & Security Act (EISA)** of 2007 requires that all new Federal buildings have at least 30 percent of the hot water demand met with a solar hot water system if it is life-cycle cost effective. The EISA also establishes a requirement for all new Federal buildings to have a reduced dependence on fossil fuels. According to the EISA, "... (new) buildings shall be designed so that the fossil

fuel-generated energy consumption of the buildings is reduced, as compared with such energy consumption by a similar building in FY 2003."

The VA is required to meet these energy requirements. The Facility currently has no renewable energy-producing sources, and is traditionally connected to local utilities. The Facility's electric system serves the main medical center (Building 1), resident quarters, National Guard offices, research service center, the boiler house (Building 7), main building chillers, ambulatory care building, and other associated buildings. Electric power commodity is supplied and delivered to the Facility from Public Service of New Hampshire Company (PSNH). The Facility's energy consumption patterns over a 12-month period showed an electric demand peak usage of about 1,400 kilowatts (kW) (summer) to a low of about 700 kW (winter) and an associated steam usage of about 9 thousand pounds per hour (klb/hr) to 40 klb/hr (Novi Energy, 2010).

The Facility's Central Heating System is supplied by the boiler plant located in Building 7. Building 7 was constructed in the 1950s and is located at the northern edge of the property (see Figure 1). The boiler house includes four Cleaver Brooks dual-fuel boilers that generate saturated steam at 90 pounds per square inch gauge (psig):

- Boiler 1 (also called the summer boiler) is a firetube boiler installed in 1995 that has a capacity of generating 8.625 klb/hr of saturated steam. This boiler operates year-round.
- Boiler 2 is an aging 15 klb/hr watertube boiler that is no longer in use. This boiler was installed in 1977.
- Boiler 3 is an aging watertube boiler with a rated capacity of 15 klb/hr which is switched on during winter months to meet the Facility's thermal loads. Similar to Boiler 2, this unit was installed in 1977.
- Boiler 4 is a firetube boiler installed in 2007 that has a rated capacity of 10 klb/hr which is also switched on during winter months to meet the Facility's thermal loads.

Exhaust gases from Boilers 2 and 3 are ducted and vented through a common stack located at the back end of the boiler plant and Boilers 1 and 4 have their own individual vent stacks that exit through the roof of Building 7. Boilers at this Facility do not have economizers. Steam generated by the boiler plant is supplied to Medical Center buildings via underground steam pipes. Underground steam lines from Building 7 go to Building 1 and from Building 1 are distributed to Buildings 15 and 18. An additional underground steam line also goes from Building 7 to Buildings 6 and 5 which use the steam to provide heating hot water (HHW) to those buildings. Buildings 2, 3, and 4 have their own individual gas boilers for heat (similar to a home heating boiler).

In order to assess ways to improve energy efficiency and reduce energy consumption at the Facility, the VA completed a feasibility study in February of 2010. The feasibility study was used to determine the technical and financial feasibility of implementing a CHP system fueled by natural gas, Biomass or Alternate Methane Fuels (Novi Energy, 2010). The feasibility study provided the VA with a decision-making tool for determining which potential energy system best met the purpose and need for the Proposed Action to construct and operate a CHP plant at the Facility.

1.3 Purpose and Need

The purpose of the Proposed Action is to install and operate a new, reliable, sufficient onsite steam heating plant and source for electrical generation at the Facility, as well as to meet the goals and objectives of the above described Federal energy requirements. Through the analysis described in Section 2.3, the VA proposes to implement a traditional natural gas-fired CHP plant at the Facility to achieve this dual purpose.

A new heating plant is needed to replace the current antiquated boiler (Boiler 2) of the heating plant and to ensure sustainable facility operations in the future. New packaged boilers perform at a higher efficiency than the existing watertube boilers, which is attributed to factors such as increased thermal insulation, reduction of boiler cycling, control automation, the ability to better match building loads and increased heat transfer (National Grid, 2010). In addition, CHP or cogeneration systems eliminate heat and distribution losses¹ and increase fuel efficiency by providing electrical and thermal outputs at the point of use. As a result, CHP systems produce annual savings from the production of both electricity and heating from one source. They also provide other ancillary benefits by often continuing to generate power during local power outage events and often reducing the emission levels of carbon dioxide (CO₂) and GHGs when compared to conventional means of power and heat generation

When all factors are accounted for including energy costs, maintenance, operation, and future capital expenditures, the CHP plant would improve energy efficiency and reduce energy consumption at the Facility. These efficiencies would aid the VA in reducing overall operating costs and GHG emissions. Therefore, the Proposed Action would help the Facility meet the energy reduction requirements described in Section 1.2.

1.4 Environmental Assessment Process

This Environmental Assessment (EA) has been prepared to identify, analyze, and document the potential physical, environmental, cultural, and socioeconomic effects associated with the VA's Proposed Action of installing and operating a CHP plant at the Facility.

The VA, as a Federal agency, is required to incorporate environmental considerations into their decision-making process for the actions they propose to undertake. This is done in accordance with the National Environmental Policy Act of 1969 ([NEPA]; 42 United States Code [USC] 4321 *et seq.*), the Council on Environmental Quality (CEQ) Regulations Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [CFR] 1500-1508), 38 CFR Part 26 (*Environmental Effects of the Department of Veterans Affairs Actions*) and the *VA NEPA Interim Guidance for Projects* (VA, 2010).

In accordance with the above regulations, the VA has prepared this EA. This EA allows for public input into the Federal decision-making process; provides Federal decision-makers with an understanding of potential environmental effects of their decisions, before making these decisions; and documents the NEPA process.

Taking into account potential environmental, cultural, and socioeconomic effects, the VA will ultimately decide, in part based on the analysis presented in this EA, whether the VA should

¹Heat is a by-product of electrical generation at central generating stations which is often rejected into the atmosphere due to the remote location of most power plants.

implement the Proposed Action and, as appropriate, carry out mitigation measures to reduce effects on the environment.

1.5 Public Involvement and Agency Coordination

The VA invites public participation in decision-making on new proposals through the NEPA process. Public participation with respect to decision-making on the Proposed Action is guided by 38 CFR Part 26, the VA's policy for implementing the NEPA. The *VA NEPA Interim Guidance for Projects* (VA, 2010) provides additional guidance.

Consideration of the views and information of all interested persons promotes open communication and enables better Federal decision-making. Agencies, organizations, and members of the public with a potential interest in the Proposed Action, including Federally-recognized Native American tribes and minority, low-income, and disadvantaged persons, are urged to participate. Appendix A provides a record of public involvement and agency coordination conducted in association with this EA.

Should substantive comments be provided during the public review process, the VA will consider these comments carefully, address these comments, and determine whether a Finding of No Significant Impact (FONSI) is the appropriate NEPA decision document, per the specified regulations.

1.5.1 Public Review

The VA has prepared and publicly circulated this Draft EA and Finding of No Significant Impact (FONSI). The Draft EA and FONSI were placed for review at the Manchester City Public Library (405 Pine Street) for a 30-day public review and comment period by interested parties. Based on the analysis presented in this EA and summarized in the FONSI, the VA has determined that the Proposed Action would not result in significant adverse environmental effects, provided the mitigation measures identified in this EA are implemented.

1.5.2 Agency Coordination

Interagency and Intergovernmental Coordination for Environmental Planning (IICEP) is a Federally-mandated process for informing and coordinating with other governmental agencies regarding Federal Proposed Actions. CEQ Regulations require intergovernmental notifications prior to making any detailed statement of environmental impacts.

Through the IICEP process, the VA notifies relevant Federal, state, and local agencies and allows them sufficient time to make known their environmental concerns specific to a Proposed Action. Comments and concerns submitted by these agencies during the IICEP process were subsequently incorporated into the analysis of potential environmental impacts conducted as part of this EA. This coordination fulfills requirements under EO 12372 (superseded by EO 12416, and subsequently supplemented by EO 13132), which requires Federal agencies to cooperate with and consider state and local views in implementing a Federal proposal. It also constitutes the IICEP process for this EA.

Agencies consulted for this EA include the US Fish and Wildlife Service (USFWS) New England Field Office, New Hampshire Division of Forests and Lands – Natural Heritage Bureau, and the New Hampshire Division of Historical Resources, or State Historic

Preservation Office [SHPO]). Agency information and comments have been incorporated into this EA. Appendix A provides copies of relevant correspondence.

Both the USFWS and Natural Heritage Bureau have online (internet) procedures for identifying a project's potential for adversely impacting species and habitat protected under Section 7 of the Endangered Species Act. Based on the Proposed Action's location, nature of activities, and lack of protected species and habitat, both agencies have determined the Proposed Action would result in no adverse effect to threatened and endangered species or protected habitat (see Appendix A).

As discussed in Section 3.3, The VA completed a New Hampshire Division of Historical Resources (DHR) Inventory Form which is currently under review with the New Hampshire SHPO for possible proposal of Facility eligibility for listing in the National Register of Historic Places (NRHP). A copy of this Draft EA has been forwarded to the SHPO for review of the proposed CHP facility. This EA will be updated as a result of the coordination efforts and document review that are in progress with the SHPO, as and where appropriate.

1.5.3 Native American Consultation

The VA conducts consultation with Federally-recognized Native American tribes as required under the NEPA, the National Historic Preservation Act (NHPA), and the Native American Graves Protection and Repatriation Act (NAGPRA). Tribes are invited to participate in the EA and NHPA Section 106 processes as Sovereign Nations per EO 13175, *Consultation and Coordination with Indian Tribal Governments*, 6 November 2000. No Federally-recognized tribes were identified in the State of New Hampshire (NSCL, 2011); therefore, no consultation was conducted.

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SECTION 2: DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.1 Introduction

This Section provides the reader with necessary information on the Proposed Action and its alternatives, including those that the VA considered, but eliminated, and the reasons for eliminating them. The screening criteria and alternatives development and review process applied by the VA to hone the number of reasonable alternatives are described, providing the reader with an understanding of the VA's rationale in ultimately retaining for analysis within this EA a single action alternative, the Preferred Action Alternative, which meets the VA's purpose of and need for the Proposed Action.

2.2 Proposed Action

The VA's Proposed Action is construction and operation of a CHP system fueled by natural gas. The Proposed Action consists of demolition and removal of Boiler 2 and replacement of this unit with one Reciprocating Internal Combustion Engine (RICE) Generator (about 650 kilowatt electrical [kWe]) with a Heat Recovery Steam Generator (HRSG) (or similar technology).

2.2.1 Construction

Construction of the CHP plant is anticipated to last approximately 9 months. The proposed CHP plant would be located inside Building 7 where Boiler 2 currently exists (see Figures 2 and 3). The plant would likely be vented through the existing stack associated with Building 7. If the existing stack is not determined feasible for venting the CHP plant, then it would be vented through the roof in a manner similar to Boilers 1 and 4 and designed in accordance with good engineering practices per U.S. Environmental Protection Agency (USEPA) guidance documents.



Figure 2: View of Building 7, Facing North. The proposed CHP plant would be located approximately on the center of the north-facing wall of Building 7 where Boiler 2 is located. The stack associated with Building 7 can also be viewed in the left of the photo.



Figure 3: Proposed Location for the CHP Plant. Boiler 3 is in the foreground. Boiler 2 (to the back of the photograph) would be removed and replaced with the CHP system.

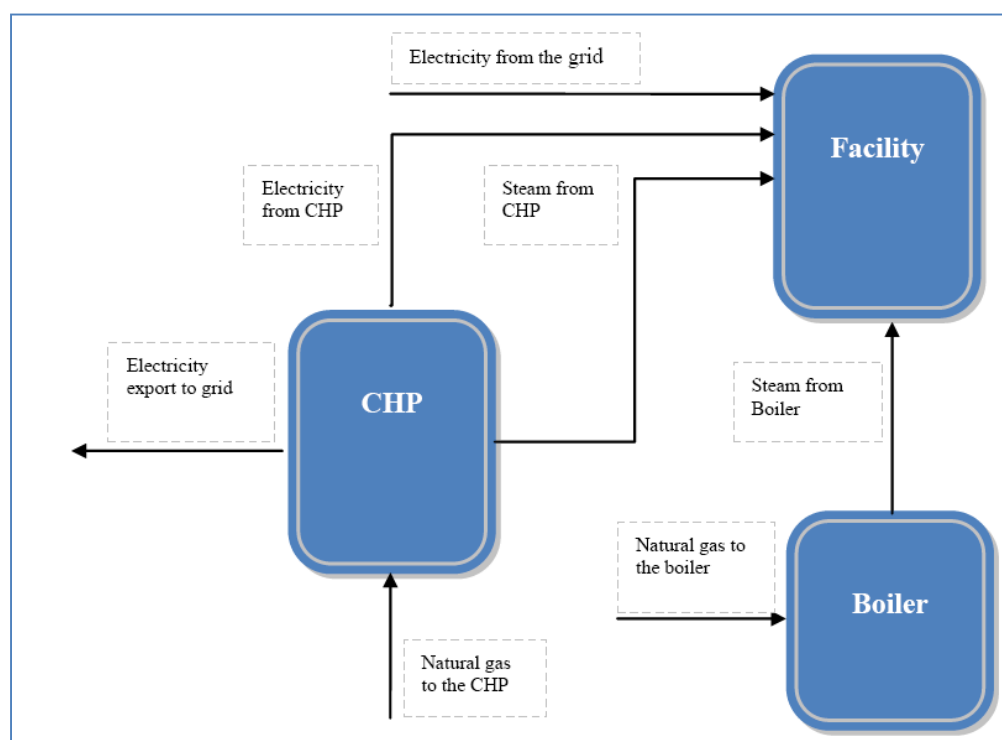
Construction would also involve the reconfiguration of the existing boiler plant piping and valve systems so they are compatible with the CHP system and tie points. Tie points to existing infrastructure would be as follows:

- Electric – Generated electrical energy would be grid synchronized and supplied to the primary switchgear which is located in the open area between Buildings 1 and 15 (approximately 450 feet from the proposed site).
- Steam – The main steam header is located within Building 7 and is within 50 feet of the proposed site.
- Natural Gas – Utility natural gas supply is located outside the boiler plant. The proposed unit would connect to the boiler gas supply line. The current natural gas connection at Building 7, however, would need to be retrofitted to accommodate the higher pressure gas required for CHP system operation. This retrofit would require modifications to the existing meter unit outside of Building 7; no installation of a new natural gas line would be needed.
- Water – Conditioned boiler feed water would be supplied from the boiler plant to the CHP unit's heat recovery steam generator.

Construction staging areas would be restricted to the existing parking lots at the Facility. Either the backside of Lot E or a portion of the General Services Administration Lot would be used for construction staging. As the proposed location is within the existing Building 7, minimal site work and ground disturbance would be required. Primary construction equipment would involve dump trucks and cranes. Construction traffic would include typically 1 to 2 trucks per day with a peak of 5 per day. Construction workers would average between 2 to 5 per day with a maximum of 10 workers during the height of construction activities. As part of the Proposed Action, the existing Boiler 2 would be removed. This would involve decommissioning the unit within Building 7.

2.2.2 Operations

The basic operation of the proposed CHP plant is displayed in Figure 4. The CHP plant would consist of one RICE Generator (about 650 kWe) and a HRSG (or similar technology) to supply most of the electricity and steam load for the Facility. All equipment would be located inside Building 7. Additional power demand from the Facility not met by the CHP plant would be fulfilled through supplemental power purchase from the grid; however, it is anticipated that the CHP plant would be able to accommodate most of the Facility's energy demands. It is also anticipated the CHP plant would be able to accommodate 100 percent of the steam requirements in summer months. During months with greater steam requirements, particularly during the colder winter months, steam produced from the existing operational boilers (primarily Boilers 1 and 4) would be used to supplement the steam produced by the CHP plant to accommodate higher demands. The existing boilers would also be used for steam generation during periods the CHP plant is offline for maintenance activities.



Note: Electricity generated is not proposed for being exported to the grid as shown in the general schematic.

Source: Novi Energy, 2010

Figure 4: CHP System Process

Based on the Facility's annual thermal and electric load profile, the average overall CHP plant's efficiency would be in the range of 60 – 65 percent (Novi Energy, 2010). The CHP plant would have the capability to provide additional thermal loads and this heat could be utilized for hot water production. The equipment would be configured to operate in a load follow mode and there would be no export to the grid. Electrical energy generated by the CHP plant would be grid synchronized and connected to the primary distribution switchgear.

The engine would operate at all times (24 hours a day/7 days a week) and would require minimal supervision by plant operating personnel. As the plant would be installed within the existing boiler plant building, no additional personnel would be required for the CHP plant operations. Routine maintenance activities would be necessary as per equipment manufacturer requirements; maintenance periods of 1 week per quarter (4 times/year) with the potential for prolonged month-long extended maintenance once a year are anticipated for the CHP plant.

It is estimated that the CHP system would have a total annual operating cost of \$553,229; with a total annual savings of \$733,677 (National Grid, 2010).

2.3 Alternatives Considered

The NEPA, CEQ Regulations, and 38 CFR Part 26 require that all reasonable alternatives be rigorously explored and objectively evaluated. Alternatives that are eliminated from detailed study must be identified along with a brief discussion of the reasons for eliminating them. For purposes of analysis, an alternative was considered "reasonable" only if it would enable the VA to accomplish the primary mission of providing a new onsite heating plant, including improving energy efficiency at the Facility, which meets the purpose of and need for the Proposed Action. "Unreasonable" alternatives would not enable the VA to meet the purpose of and need for the Proposed Action.

2.3.1 Alternatives Development (Screening Criteria)

The VA undertook a sequential planning and screening process, seeking reasonable alternatives for the Proposed Action. This process is summarized below:

- The alternative chosen should assist the VA in meeting the requirements of the Energy Policy Act of 2005, the EISA, and EOs 13423 and 13514 (see Section 1.2).
- The VA examined the potential for onsite renewable energy, or CHP plant. The VA did not consider offsite locations, as these would not maximize the credits under the Energy Policy Act and would produce additional challenges, including the transmission of steam to the Facility from offsite locations.
- Minimal area is available for constructing new buildings or infrastructure at the Facility since most of the area in the property is being utilized; therefore, the Alternative to be carried forward for analysis must have a footprint suitable for limited development space constraints.

2.3.2.1 Preferred Action Alternative

Under the Preferred Action Alternative, the VA would install and operate the Proposed Action as described in Section 2.2. Through the VA's screening process, the VA determined this

alternative to be the only reasonable action alternative that would meet all of the VA's screening criteria, while achieving the purpose of and need for the Proposed Action.

2.3.2.2 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be implemented. The VA would continue to use existing infrastructure to power and heat the facility. This infrastructure would continue to operate at an inefficient level relative to existing and readily-available technology. As a result, the Facility would not contribute to the VA's ability to meet the requirements set forth in EO 13423, EO 13514, the EISA, and the Energy Policy Act of 2005.

While the No Action Alternative would not satisfy the purpose of or need for the Proposed Action, this alternative was retained to provide a comparative baseline against which to analyze the effects of the Proposed Action, as required under the CEQ Regulations (40 CFR 1502.14). The No Action Alternative reflects the *status quo* and serves as a benchmark against which the effects of the Proposed Action can be evaluated.

2.3.2 Alternatives Eliminated From Detailed Consideration

The VA completed a feasibility study in 2010 (Novi Energy, 2010) to determine the technical and financial feasibility of implementing a CHP system fueled by natural gas, Biomass or Alternate Methane Fuels. The Facility, however, is not conducive for a solid fuel biomass-fired CHP plant for the following reasons (Novi Energy, 2010):

- Land availability – The Facility is limited by the area available for fuel storage, ash handling, and the construction of a new solid fuel boiler house.
- Transportation – Given the location of the VAMC in a residential neighborhood, the facility cannot support truck traffic that would be necessary for transporting fuel and removing ash generated by biomass energy production methods.

The use of landfill gas (a low British thermal unit [BTU²] gas that is produced as a result of decomposition of waste matter in a community landfill) was also preliminarily considered. Once extracted from the landfill, gas is filtered to remove inherent impurities and moisture, and conditioned to be fired in internal combustion engines or turbines for electric power production. This gas can be piped over short distances from the landfill to the customer location for use. No landfills are located in the local area, however, which would make this alternative unfeasible (Novi Energy, 2010).

Natural gas-fired options were evaluated in the feasibility study: One Machine – 848 kW; and Two Machines – 633 kW. Based on space constraints and energy and cost efficiency, the VA has decided that one RICE Generator (about 650 KWe) is the optimal system for the Facility's needs. The feasibility study also evaluated two sites for location of the CHP plant, both exterior from Building 7. Following findings from the study, and due to space constraints and proximity to residential areas, the VA determined the best option would be to locate the CHP plant within Building 7 in the location of the existing Boiler 2. Therefore, only one Proposed Action alternative is evaluated within this EA as described in Section 2.3.1.

² An energy unit equivalent to the amount of energy needed to raise the temperature of 1 pound of water 1° Fahrenheit (F) from 58.5°F to 59.5°F under standard pressure of 30 inches of mercury.

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SECTION 3: ENVIRONMENTAL IMPACT ANALYSIS

3.1 Introduction

This Section provides appropriate environmental, cultural, and socioeconomic baseline information and identifies and evaluates the direct, indirect, and cumulative environmental and socioeconomic changes likely to result from the implementation of the Preferred Action Alternative (i.e., Proposed Action) and the No Action Alternative. Appendix A presents relevant agency coordination conducted during the NEPA process; Appendix B presents the VA's standard environmental checklists for the Preferred Action Alternative; Appendix C presents public notices and substantive public comments associated with this NEPA process; Appendix D presents air emissions modeling calculations; and Appendix E presents relevant cultural resources data for the Proposed Action and the Facility.

In compliance with the NEPA and CEQ Regulations, the description of the affected environment focuses on those resources and conditions potentially subject to effects from implementing the Proposed Action. The VA, as encouraged by the CEQ Regulations, endeavors to keep the NEPA analyses as concise and focused as possible. This is in accord with CEQ Regulations at 40 CFR Part 1500.1(b) and 1500.4(b): "...NEPA documents must concentrate on the issues that are truly significant to the action in question, rather than amassing needless detail....prepare analytic rather than encyclopedic analyses."

3.2 Resources Analyzed

Table 1 presents the Technical Resource Areas that are dismissed from further analysis or are fully analyzed in this EA, and the rationale for dismissing or analyzing each Technical Resource Area.

In conducting this analysis, a qualified Subject Matter Expert (SME) reviewed the potential direct and indirect effects of the Proposed Action and the No Action Alternative relative to each Technical Resource Area. The SME carefully analyzed and considered the existing conditions of each Technical Resource Area within the Proposed Action's region of influence (ROI). Through this analysis, it was determined that, for several Technical Resource Areas, no adverse effects would occur, notably potentially significant adverse effects. Table 1 and Section 3.3 identify and discuss those Technical Resource Areas that are retained for further analysis. Potential cumulative effects are analyzed in Section 3.4.

Table 1. Technical Resource Areas Assessed in the Environmental Assessment

Technical Area	Dismissed?	Rationale
Aesthetics	Yes	<p>The CHP plant would be located within the existing Building 7 and may be vented through the existing stack associated with Building 7, causing no permanent visual impacts. If the CHP is not vented through the existing stack, it would be vented through the roof in a manner similar to Boilers 1 and 4 and designed in accordance with good engineering practices per USEPA guidance documents.</p> <p>During construction, visual impacts may occur due to the use of and stockpiling of construction equipment, as well as the delivery of materials. The majority of stockpiling, however, would occur within existing parking lots (primarily Lot E), away from the medical center complex and buffered by an approximate 100-foot wide area of forest from adjacent residential properties. Aesthetics impacts would, therefore, be temporary and negligible. Due to the low potential for impact, aesthetics have been dismissed from further discussion within this EA.</p>
Air Quality/Greenhouse Gases	No	<p>As the proposed facility would result in an increase in natural gas usage and a change in emissions, the potential could exist for adverse impacts to air quality, including an increase in the level of GHGs emitted. As a result, this resource area is further discussed in Section 3.3.1.</p>
Biological Resources (vegetation, wildlife, threatened and endangered species)	Yes	<p>The Proposed Action footprint is within the existing Building 7 and, therefore, no direct or indirect impacts to biological resources would be anticipated. According to the New Hampshire Natural Heritage Bureau DataCheck Tool, no known records of protected species occur within vicinity of the project site (New Hampshire Division of Forests and Lands, 2011). According to the USFWS, the only Federally-listed species identified as occurring in Hillsborough County is the Small whorled Pagonia (a Federally-threatened plant) and no critical habitat exists within the State of New Hampshire (USFWS, 2011). Disturbance of this species is unlikely as the project would be confined within Building 7 and stockpiling would occur within developed parking lots. Due to the lack of biological resources within the footprint and the no impact determination for biological resources, this topic has been dismissed from further discussion within this EA. Appendix A contains relevant impact determinations following both the USFWS's and New Hampshire Natural Heritage Bureau's online impact assessment guidance.</p>
Community Services	Yes	<p>No community services' effects would occur. There would be a temporary increase of construction workers during the construction period; however, this increase would be temporary and negligible, and would not affect community services such as law enforcement, fire protection, medical care, schools, family support services, shopping, or recreation facilities.</p> <p>The operation of the plant would not require the hiring of any additional employees and would, therefore, result in no impacts to community services. Due to the nature of potential effects, this resource area has been eliminated from further consideration within this EA.</p>
Utilities	No	<p>The Proposed Action would not result in any change in water demand at the Facility. The water demand for the proposed CHP plant is expected to align very closely with the water demand for the existing plant, as little to no change in steam demand is expected. Furthermore, no modifications are anticipated for the Facility's existing Class I Industrial User Discharge Permit No. 1018; therefore, these topics have not been included in the utility discussions.</p> <p>The Proposed Action could, however, involve modifications to existing natural gas and electrical distribution and consumption; therefore, these two topics are discussed further in this EA (see Section 3.3.2).</p>

Table 1. Technical Resource Areas Assessed in the Environmental Assessment

Technical Area	Dismissed?	Rationale
Cultural Resources	No	The Proposed Action would affect structures over 50 years old and would occur within an area under consideration for listing as a Historic District. As a result, this resource area is further discussed in Section 3.3.3.
Floodplains and Wetlands	Yes	There are no known jurisdictional wetlands or 100-year floodplains within proximity to the Proposed Action's footprint. As the Proposed Action footprint is within the existing Building 7, no direct or indirect impacts to floodplains and wetlands would occur. Due to the no impact determination, this topic has been dismissed from further discussion within this EA.
Watershed, Rivers, Lakes and Coastal Zones (Water Resources)	Yes	There are no surface water features or coastal zone within or directly adjacent to the Proposed Action site. The nearest surface water feature is an intermittent stream and wetland complex located within the southeast corner of the Facility property (approximately 800 feet from the proposed CHP facility location). As the Proposed Action would be located indoors and appropriate pollution prevention control measures would be implemented during construction and operations in the event of a spill (see Section 3.3.5), no direct or indirect impacts to water resources would be anticipated. Due to the no impact determination, this topic has been dismissed from further discussion within this EA.
Geography, Topography, and Soils	Yes	Construction of the Proposed Action would not result in the disturbance of any previously undisturbed areas; therefore, no adverse direct or indirect effects would occur to geology or soils. Effects from construction-related soil erosion would not be anticipated as the Proposed Action would be constructed inside of Building 7. As no ground/soil disturbance is anticipated, the project would be exempt from the National Pollution Discharge Elimination System (NPDES) permitting process. Due to the no impact determination, this topic has been dismissed from further discussion within this EA.
Hydrology and Water Quality	Yes	The Proposed Action would not result in a change in capacity of available surface water resources, significantly adversely affect ground or surface water quantity or quality, nor conflict with established water rights; therefore, hydrology and water quality are not further discussed in this EA (see also Water Resources).
Land Use	Yes	The Proposed Action would occur within the existing boiler plant Building 7, which is consistent with its current uses. No conflicts with land use planning or zoning would occur. Due to the no impact determination, this topic has been dismissed from further discussion within this EA.
Noise	No	As sensitive noise receptors (residences) are located within proximity (250 feet) from the proposed CHP plant site, construction and operations of the plant could adversely impact these receptors and medical center operations. As a result, this resource topic is further discussed in Section 3.3.4.
Socioeconomics (economy, population, housing, employment, Protection of Children, Environmental Justice, and emergency services)	Yes	<p>The Proposed Action is not expected to result in any adverse effects to the local or regional socioeconomic environment. The Proposed Action would have temporary beneficial economic effects associated with employment of construction personnel, transportation of goods and materials to the construction site. No permanent workers would be hired for operations; therefore, no changes in employment at the Facility would be anticipated as a result of the Proposed Action.</p> <p>There would be no permanent change in sales volume, income, employment, or population as a result of the Proposed Action; therefore, there would be no effects on public services such as law enforcement, fire protection, medical care, schools, family support services, shopping, or recreation facilities. Due to the nature of potential effects, this topic has been eliminated from further consideration within this EA.</p>

Table 1. Technical Resource Areas Assessed in the Environmental Assessment

Technical Area	Dismissed?	Rationale
Solid and Hazardous Wastes	No	As the Proposed Action involves decommissioning of the existing Boiler 2, a potential exists for impacts to solid and hazardous waste. As a result, this resource topic is further discussed in Section 3.3.5.
Transportation and Parking	Yes	<p>During construction, traffic would increase due to additional construction vehicles and construction workers. No onsite traffic pattern changes (i.e., detours) within the Facility would be required. A peak of 5 trucks per day is anticipated during construction. Due to the low and temporary increase of traffic volume, negligible increases vehicles during construction would occur on local roads and internal Facility roads. All construction vehicles would be equipped with backing alarms, two-way radios, and Slow Moving Vehicle signs, when appropriate.</p> <p>A temporary loss of parking would occur from parking and equipment staging areas. A parking demand model for the Facility was run in November of 2010, which evaluated the existing number of parking spots (800 surface spaces) to the levels of staff/employees, patients and visitors. Based on the model, it was determined that sufficient parking is available at the Facility with an excess of 32 spaces. Therefore, adverse impacts resulting from temporary loss of parking due to construction staging would be negligible to minor.</p> <p>As operations of the proposed CHP plant would not result in an increase of staff at the Facility, no long-term adverse impacts to transportation or parking would be anticipated. Due to the nature of potential effects, this topic has been eliminated from further consideration within this EA.</p>
Cumulative Effects	No	Analysis required per CEQ Regulations (See Section 3.4).

3.3 Resources Considered

As identified in Table 1, environmental resource areas carried forward for further effects analysis of the Preferred Action Alternative and the No Action Alternative include: air quality/GHGs; utilities; cultural resources; noise; solid and hazardous wastes; and cumulative effects.

3.3.1 Air Quality and GHGs

This section provides an overview of the National Ambient Air Quality Standards (NAAQS), the attainment status of the region, air quality regulations, facility-wide air emissions, and existing GHG requirements.

National Ambient Air Quality Standards

The USEPA Region 1 and the New Hampshire Department of Environmental Services (NHDES), regulate air quality in New Hampshire. The Clean Air Act (CAA) (42 United States Code (USC) 7401-7671q), as amended, gives the USEPA the responsibility to establish the primary and secondary NAAQS (40 CFR Part 50) that set acceptable concentration levels for seven criteria pollutants: fine particulate matter (PM₁₀), very fine particles (PM_{2.5}), sulfur dioxide (SO₂), carbon monoxide (CO), nitrous oxides (NO_x), ozone (O₃), and lead. Short-term standards (1-, 8-, and 24-hour periods) have been established for pollutants that contribute to acute health effects, while long-term standards (annual averages) have been established for pollutants that contribute to chronic health effects. New Hampshire has adopted the Federal standards.

Air-Quality Control Regions (AQCRs) that exceed the NAAQS are designated *nonattainment* areas and those in accordance with the standards are *attainment* areas. The General Conformity Rule (40 CFR Part 51, Subpart W, and 40 CFR Part 93) ensures that the actions taken by Federal agencies in nonattainment and maintenance areas do not impede the state's ability to achieve the NAAQS in a timely fashion. The Facility, and therefore, all activities associated with the Preferred Action Alternative are within the Merrimack Valley-Southern New Hampshire AQCR 121 (40 CFR 81.81). USEPA has designated Boston, Manchester, and Portsmouth as moderate non-attainment for 8-hour ozone NAAQS (USEPA, 2011a). Because the proposed project is in a nonattainment area, the air conformity regulations may apply. In addition, the region is in the O₃ transport region (OTR) that includes 12 states and Washington, DC.

Because air quality is measured and regulated on a regional level, the ROI for the air quality analysis in this EA is AQCR 121, and those portions of New Hampshire where the Preferred Action Alternative would occur. The NHDES monitors levels of criteria pollutants at representative sites in each region throughout New Hampshire, and has two monitoring stations near the Facility in Manchester and in Nashua. For the Manchester station, Table 2 includes the monitored concentrations of CO, SO₂, PM₁₀, and PM_{2.5} for 2006, 2007, and 2008. No other criteria pollutants are monitored at this location.

Table 2. Air Quality Standards and Ambient Air Concentrations AQCR 121

Pollutant	2006	2007	2008	Federal Standards ¹	
				Primary ²	Secondary ³
Carbon Monoxide (parts per million - ppm) 1-hour average	8.2	5.9	9.4	35	None
8-hour average	5.8	1.8	4.4	9	
Ozone (ppm) 8-hour highest ⁴	0.076	0.086	0.064	0.075	Same as Primary Standard
8-hour 2 nd highest	0.072	0.075	0.064	0.075	
SO₂ (ppm) 3-hour highest	0.044	0.046	0.036	None	0.50
3-hour 2 nd highest	0.036	0.043	0.036		
24-hour highest	0.018	0.019	0.017	0.14	None
24-hour 2 nd highest	0.014	0.018	0.016	-	
Annual Arithmetic Mean	0.004	0.003	0.003	0.03	
PM₁₀ (micrograms per cubic meter - µg/m³) 24-hour highest	43	41	54	150	Same as Primary Standard
24-hour 2 nd highest	31	32	25	-	
PM_{2.5} (µg/m³) 24-hour highest	(No Data)	(No Data)	(No Data)	35	Same as Primary Standard
24-hour 2 nd highest				-	
Annual Arithmetic Mean				15	

Notes:

¹National averages (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the expected number of days per calendar year, with a maximum hourly average concentration above the standard, is equal to or less than one.

² National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

³ National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects from a pollutant.

⁴ Not to be exceeded by the 3-year average of the annual fourth highest daily maximum 8-hour average.

Sources: USEPA, 2011b; 40 CFR Part 50; 73 FR 16436-16514.

Regulatory Requirements and Existing Emissions

On the basis of the Facility's potential to emit, it is a minor source of air emissions as defined by the CAA. The Facility operates under two air operation permits (Permit numbers FP-S-0029, expiration date December 31, 2012; GSP-EG-170, expiration date April 30, 2013) (Manchester VAMC, 2011). As part of the permit requirements, the Facility tracks air emissions from its significant stationary emission sources, which are the existing boilers and generators. Table 3 lists the air emissions at the Facility for calendar year 2010.

Table 3. Annual Emissions at the Manchester Campus

Pollutant	Emissions (tons per year [tpy])
Particulate Matter (PM) (PM_{2.5}, PM₁₀)	0.03
Nitrogen oxides (NO_x)	1.38
Sulfur dioxide (SO₂)	0.06
Volatile organic compounds (VOCs)	0.08
Carbon monoxide (CO)	1.05

Source: VA, 2011

Climate and Greenhouse Gases

The climate in the Manchester, New Hampshire region is characterized by mild summers and very cold winters. Precipitation is evenly distributed throughout the year, the wettest month being October with approximately 3.7 inches (9.4 centimeters) of precipitation, and the driest month being February with approximately 2.3 inches (5.8 centimeters). January, historically the coldest month, has an average temperature of 18.8 degrees Fahrenheit (°F)(-7.3 degrees Celsius (°C)). In July, historically the warmest month, temperatures reach approximately 68.4 °F (20.2 °C) and can fluctuate by cooling 27 °F (-2.8 °C) from day to evening (Idcide, 2011).

GHGs are components of the atmosphere that trap heat relatively near the surface of the earth, and therefore, contribute to the greenhouse effect and global warming. Most GHGs occur naturally in the atmosphere, but increases in their concentration result from human activities such as the burning of fossil fuels. Global temperatures are expected to continue to rise as human activities continue to add CO₂, methane, NO_x, and other greenhouse (or heat-trapping) gases to the atmosphere. Human health, agriculture, natural ecosystems, coastal areas, and heating and cooling requirements are examples of climate-sensitive systems. Some observed changes include shrinking of glaciers, thawing of permafrost, later freezing and earlier break-up of ice on rivers and lakes, lengthening of growing seasons, shifts in plant and animal ranges and earlier flowering of trees (USEPA, 2007; IPCC, 2007).

Federal agencies, states, and local communities address global warming by preparing GHG inventories and adopting policies that will result in a decrease of GHG emissions. EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, outlines policies intended to ensure that Federal agencies evaluate climate change risks and vulnerabilities, and to manage the short- and long-term effects of climate change on their operations and mission. The EO specifically requires Federal agencies to measure, report, and reduce their GHG emissions from both their direct and indirect activities. Direct activities include sources the agencies own and control, and from the generation of electricity, heat, or steam they purchased. Indirect activities include their vendor supply chains, delivery services, and employee travel and commuting. In addition, the CEQ recently released draft guidance on when and how Federal agencies should consider GHG emissions and climate change in NEPA. The draft guidance includes a presumptive effects threshold of 25,000 metric tons of CO₂ equivalent emissions from an action (CEQ, 2010).

No Action Alternative

Selecting the No Action Alternative would result in no impact to ambient air quality. No construction or renovations would be undertaken, and no new CHP system operations would take place. Ambient air quality conditions would remain unchanged when compared to existing conditions.

Preferred Action Alternative

Short-term negligible and long-term minor adverse effects on air quality would be expected. The short-term effects would be from air emissions during interior construction renovations of Building 7, and the long term effects from proposed operations of CHP equipment. Increases in emissions would not exceed *de minimis* thresholds, or contribute to a violation of any Federal, state, or local air regulation.

Air emissions outlined in this analysis are based on the best available information at this time. In the final design stages, a detailed analysis of the air emissions and regulatory compliance status of the proposed equipment would be conducted based on site-specific and detailed information about the equipment ultimately selected. This would likely be an integral part of the air permitting process. As part of this process, reductions-by-design would be incorporated into the project to ensure long-term emissions from CHP system operations were reduced to less-than-significant levels.

Estimated Emissions and General Conformity. The general conformity rules require Federal agencies to determine whether their action(s) would increase emissions of criteria pollutants above preset threshold levels (40 CFR 93.153(b)). These *de minimis* (of minimal importance) rates vary depending on the severity of the nonattainment and geographic location. Because the region is in moderate nonattainment for the 8-hour O₃ NAAQS, the air conformity regulations may apply. All direct and indirect emissions of criteria pollutants for the Preferred Action Alternative have been estimated and compared to applicability threshold levels of 100 tpy to determine the Preferred Action Alternative's impact under NEPA. The total direct and indirect emissions associated with operating the CHP systems would not exceed applicability threshold levels; therefore, the general conformity regulations do not apply (Table 4). A detailed breakdown of construction and operational emissions are in Appendix D. Notably, renovation activities are normally exempt from the general conformity rule as they are normally considered clearly *de minimis* (40 CFR 93.153(c)(2)(iv)).

Table 4. Preferred Action Alternative Emissions Compared to Applicability Thresholds

Activity	Annual Emissions (tpy)						<i>De minimis</i> threshold (tpy)	Would emissions exceed <i>de minimis</i> thresholds? [Yes/No]
	CO	NO _x	VOC	SO _x	PM ₁₀	PM _{2.5}		
Operational	8.85	17.1 ¹	3.3	<0.1	<0.1	<0.1	100(50)²	No

¹Emission Factor (lbs/million British thermal units [MMBtu]), From AP-42 Section 3.2 Natural Gas-fired Reciprocating Engines - Table 3.2-2. Assumes Selective Catalytic Reduction (SCR) reduces NO_x emissions 85 percent.

²For an area in moderate nonattainment for the 8-hour O₃ NAAQS within the OTR the applicability criterion is 50 tpy for VOCs (40 CFR 93.153).

For purposes of analysis it was assumed SCR could be used to reduce the levels of emission below the *de minimis* levels. During the final design stage and permitting process other control technologies in addition to, or instead of, SCR may be identified and used to reduce emissions to acceptable levels.

Regulatory Review. The CAA, as amended in 1990, mandates that state agencies adopt and implement State Implementation Plans (SIPs) to eliminate or reduce the severity and number of violations of the NAAQS. Since 1990, New Hampshire has developed a core of air quality regulations that the USEPA has approved. As part of these requirements, the

NHDES oversees programs for permitting the construction and operation of new or modified stationary source air emissions in New Hampshire. NHDES air permitting is required for many industries and facilities that emit regulated pollutants. These requirements include Title V permitting of major sources, New Source Review (NSR), Prevention of Significant Deterioration (PSD), New Source Performance Standards (NSPS) for selected categories of industrial sources, and the National Emission Standards for Hazardous Air Pollutants (NESHAP). The VA would be required to modify their existing Facility air permits and include the CHP unit in their inventory process. In addition, the CHP system purchased would fully comply with the NSPS.

Permitting scenarios can vary based on the types and sizes of new stationary sources, timing of the projects, and the types of controls ultimately selected. These can differ in specific features from the ones described in this EA. However, during the final design stage and the permitting process either (1) the actual equipment, controls, or operating limitations would be selected to reduce the potential to emit below the major source threshold; or (2) the permitting process would require emissions offsets from other previously decommissioned sources within the region. This cap-and-trade-type system is inherent to Federal and state air regulations, and leads to a forced reduction in regional emissions. Therefore, regardless of the ultimate permitting scenario, these impacts would be less than significant under NEPA.

Other non-permitting requirements may be required through the use of compliant practices and/or products. These regulations are outlined in USEPA, New Hampshire Air Program Rules (Env-A). They include, but are not limited to:

- Env-A 2100: Particulate Matter and Visible Emissions Standards
- Env-A 1800: Management and Control of Asbestos

This listing is not all-inclusive; the VA and any contractors performing work on behalf of the VA would comply with all applicable air pollution control regulations. In addition to those outlined above, no person shall handle, transport, or store any material in a manner which may allow unnecessary amounts of air contaminants to become airborne. During construction or renovations reasonable measures may be required to prevent unnecessary amounts of particulate matter from becoming airborne (Env-A 2100). Such precautions may include:

- Use of water for control of dust, the grading of roads, or the clearing of land;
- Paving of roadways and maintaining them in a clean condition;
- Covering open equipment for conveying or transporting material likely to create objectionable air pollution when airborne; and,
- Promptly removing spilled or tracked dirt or other materials from paved streets.

Climate and Greenhouse Gases. The Preferred Action Alternative would induce a long-term minor decrease to GHG in the atmosphere. The Preferred Action Alternative would reduce CO₂ equivalents released from the Facility by 3,491 tpy (3,167 metric tons per year [mtpy]) (Table 5). This is equivalent to annual GHG emissions from 621 passenger vehicles or the electricity use of 384 homes for one year (USEPA, 2011b). Because of this net

decrease, the Preferred Action Alternative would be consistent with EO 13514 and the draft CEQ guidance on GHG emissions.

Table 5. Estimated Net Reduction in CO₂

Existing	Measurement	Units	Estimated CO ₂ Equivalents	
			Metric Tons	Tons
Electricity from Grid	6,772,020	kWh	4,669	5,147
Existing Boiler Natural Gas Usage	236,615	MMBtu	11,831	13,041
		Total Existing	16,500	18,188
Proposed				
Natural Gas Burned in RICE	55,844	MMBtu	2,792	3,078
Boiler Natural Gas Usage with RICE	210,817	MMBtu	10,541	11,619
		Total Proposed	13,333	14,697
Net Reduction in CO₂			3,167	3,491

Sources: USEPA, 2011c; and NOVI, 2010

Proposed Mitigation Measures

The permitting process, once completed, would ensure the Preferred Action Alternative would have a less than significant effect to air quality. In the final design stages the VA and its contractors would design and construct a CHP plant that meets the environmental control requirement from USEPA and other state and local environmental protection agencies. These requirements would include Best Available Control Technology (BACT), and other controls as required, for the CHP equipment.

3.3.2 Utilities

Electricity is supplied by PSNH. Natural gas is procured from and delivered to the Facility by National Grid. The Facility's energy consumption patterns over a 12-month period show an electric demand peak usage of about 1,400 kW (summer) to a low of about 700 kW (winter) and an associated steam usage of about 9 klb/hr to 40 klb/hr (Novi Energy, 2010).

The majority of the natural gas currently utilized by the Facility is consumed by the existing heating plant, Building 7 (described in Section 1.3). Centrally produced steam (generated at 90 psig) is reduced to about 40 psig and then sent to Buildings 1, 15 and 18 via underground steam pipes. Within each building the incoming steam pressure is reduced further and is supplied to different sections of the building. All heated buildings are connected to the central steam system with the exception of Buildings 2, 3, 4 and 5 that have individual boilers. A natural gas regulating station is located adjacent to the boiler plant and along the west wall of this building. This station is calibrated to meet the existing natural gas demands of the facility and would need to be retrofitted to meet the use requirements of the CHP system (Novi Energy, 2010).

All boilers were retrofitted with CB Hawk ICS Combustion Control Systems in 2008 to ensure proper efficiency levels are being maintained. These boilers are dual fuel; two 20,000-gallon outdoor aboveground storage tanks (ASTs), hold No. 2 diesel fuel, which is used as a backup fuel source during emergencies. To prevent the oil from "sludging", the facility typically tries to consume a total of 20,000 gallons of diesel fuel per year (Novi Energy, 2010).

No Action Alternative

Under the No Action Alternative, there would be no effects to utility suppliers, demands, or infrastructure associated with the Facility. No changes to current conditions would occur. Replacement of existing boilers would be necessary in the future as these systems become outdated and antiquated.

Preferred Action Alternative

Under the Preferred Action Alternative, the Facility's need for natural gas would slightly increase. Table 6 compares existing levels of natural gas usage over a period from September 2008 to August of 2009 with the predicted levels of natural gas usage with the operating CHP plant.

Table 6: Current and Projected Facility Fuel Consumption

Period	Current Boiler Fuel Consumption (MMBtu)	CHP Plant Fuel Consumption (MMBtu)	Boiler Fuel Consumption with CHP (MMBtu)	Total Projected Fuel Consumption (MMBtu)	Change in Fuel Consumption from Current (MMBtu)
September	11,323	4,590	9,454	14,044	2,721
October	19,224	4,743	17,060	21,803	2,579
November	25,498	4,590	23,191	27,781	2,283
December	30,580	4,743	28,065	32,808	2,228
January	36,669	4,743	33,965	38,708	2,039
February	29,404	4,284	27,077	31,361	1,957
March	28,239	4,743	25,796	30,539	2,300
April	19,368	4,590	17,250	21,840	2,472
May	12,386	4,743	10,433	15,176	2,790
June	11,179	4,590	9,315	13,905	2,726
July	10,748	4,743	8,846	13,589	2,841
August*	1,997	4,743	365	5,108	3,111
Total Annual Usage	236,615	55,845	210,817	266,662	30,047

*Note: Boilers were primarily fueled by No.2 oil during the month of August.

Source: Novi Energy, 2010

As shown in Table 6, levels of annual usage of natural gas would increase by approximately 13 percent from 236,615 MMBtus to 266,662 MMBtus with an average monthly increase of approximately 2,500 MMBtus. The existing natural gas line to the Facility is capable of handling the increase in demand and would not be anticipated to effect regional natural gas supplies. As previously stated, however, the current natural gas connection at Building 7 would need to be retrofitted to accommodate the higher pressure gas required for the CHP operation. This retrofit would require modifications to the existing meter unit outside of Building 7; no installation of a new line would be needed.

The proposed CHP plant is not anticipated to significantly change the levels of current electricity usage at the Facility. It is anticipated that the CHP plant would be able to

accommodate most of the Facility's energy demands; additional power demand from the Facility not met by the CHP plant would be supplemental from the existing grid and electrical provider (PSNH). Therefore, the amount of electricity purchased from PSNH would considerably be reduced as electrical generation would be provided onsite. Generated electric power from the CHP plant would be grid synchronized and operated in parallel to the utility supply from PSNH. No power would be exported back to the grid. The Proposed Action would not cause population growth or otherwise increase utility demands in the ROI. As such, positive, long-term utilities effects are anticipated.

Based on current planning data, the VA does not anticipate an interruption to existing utility services during construction of the Proposed Action. Existing utilities within the proposed construction area would be carefully marked and avoided or relocated during construction. If, however, a service outage would be required during construction, the VA would coordinate and schedule this outage with the Facility's utility providers and onsite operations to avoid conflicts. Therefore, adverse utilities effects resulting from the Proposed Action are expected to be short-term and minor.

Proposed Mitigation Measures

No mitigation measures are required. As described above, the VA would carefully coordinate and conduct construction to avoid or relocate existing utilities, and to minimize operational effects during construction.

3.3.3 Cultural Resources

The Area of Potential Effect (APE) for the Proposed Action has been defined as the boundaries of the Facility (VAMC Manchester Campus). The proposed location for the CHP system is not located within a historic district or within a National Register of Historic Places (NRHP) listed historic property. The VA, however, completed a New Hampshire DHR Inventory Form which is currently under review with the New Hampshire SHPO for possible proposal of Facility eligibility for listing in the NRHP. According to the Form, the Facility possesses the necessary significant historical associations and architectural characteristics to be considered eligible for listing in the NRHP under Criteria A (events significant to American history) and C (embodiment of distinctive characteristics of a type, period and method of construction).

The Facility opened in July 1950. G. Frederick Smith, one-time governor of New Hampshire (1865 to 1867) previously owned the property. His estate donated the property to the U.S. Government after World War II. The property included the "Smyth Tower" which was built by Smyth in 1888 and used as a hideaway retreat. The stone tower is said to be a replica of a Scottish structure, is 31 feet high and 18.6 feet in diameter and consists of a basement, three main floors, and a rooftop parapet. The tower structure was listed on the NRHP in 1978 (NR #78000215). It is located on a small hill approximately 500 feet north-west of Building 1. The Facility was listed on the New Hampshire Division of Historical Resources inventory (NHDHR # MAN 0484) in July of 2010.

As originally designed and built (1948-1950) the Facility consisted of 13 buildings with Building 1 at the center. An additional 13 buildings have been added to the property and they are less than 50 years old with subsequent construction completed in phases during 1974, 1977, 1978, and 1987. According to a survey completed in December 2010 by Historic Documentation Company, Inc. (HDC) of Portsmouth, Rhode Island, the Facility "possesses the necessary significant historical associations and architectural characteristics

to be considered eligible for listing in the NRHP under Criteria A and C.” However, at this time, the property has not been listed on the NRHP.

No Action Alternative

Under the No Action Alternative, there would be no effects to cultural resources at the Facility. No changes to current conditions would occur.

Preferred Action Alternative

The proposed CHP plant would be located inside Building 7 known as the Boiler Plant and Garage, which is an original Facility building. The CHP would replace the existing Boiler 2. Construction staging areas would be restricted to the existing parking lots. As the proposed location is within existing Building 7, minimal site work and ground disturbance would be required. Therefore, there would be no alteration to the exterior of the building that would affect the integrity of Building 7. This proposed undertaking would not directly affect the structures and there are no negative potential visual effects.

Based on the data reviewed and presented herein, the VA has made a finding of "No Adverse Effects to Historic Properties" per 36 CFR 800.5(a) (1) (i.e., Section 106 of the NHPA) for this undertaking with regard to potential visual effects to historic structures; SHPO was consulted regarding potential effects to cultural resources; but, concurrence with this finding has not been received as of the date of this EA (see Appendix A).

With regard to subsurface archaeological resources, the proposed CHP location has a very low potential to contain significant archeological deposits as the proposed project area has been previously disturbed by grading, excavation, and the construction of Building 7. Given the very low potential for significant archaeological resources, the proposed undertaking poses no adverse effect. Moreover, there are no recorded archaeological sites within the APE or in the vicinity.

Proposed Mitigation Measures

The VA will continue to coordinate with the SHPO regarding this project and regarding the eligibility of the facility in the NRHP.

3.3.4 Noise

Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise intrusive. Human response to noise varies depending on the type and characteristics of the noise, the distance between the noise source and the receptor, receptor sensitivity, and time of day.

Sound varies by both intensity and frequency. Sound pressure level, described in decibels (dB), is used to quantify sound intensity. The dB is a logarithmic unit that expresses the ratio of a sound pressure level to a standard reference level. Hertz (Hz) are used to quantify sound frequency. The human ear responds differently to different frequencies. A-weighting, described in A-weighted decibels (dBA), approximates this frequency response to express accurately the perception of sound by humans. Sounds encountered in daily life and their approximate levels in dBA are provided in Table 7.

Table 7. Sound Level and Loudness of Typical Noises

Noise Level (dBA)	Qualification	Typical Sources
140	-	Threshold of pain
125	Uncomfortably Loud	Automobile assembly line
120	Uncomfortably Loud	Jet aircraft
100	Very Loud	Diesel truck
80	Moderately Loud	Motor bus
60	Moderate	Low conversation
40	Quiet	Quiet room
20	Very Quiet	Leaves rustling
0-10	-	Threshold of human hearing

Source: Liu and Liptak, 1997

The dBA noise metric describes steady noise levels. Very few noises are, in fact, constant, so a noise metric, the day-night sound level (DNL), has been developed. DNL is defined as the average sound energy in a 24-hour period with a 10-dB penalty added to nighttime levels (i.e., 10 p.m. to 7 a.m.). DNL is a useful descriptor for noise because it averages ongoing yet intermittent noise, and it measures total sound energy over a 24-hour period. In addition, equivalent sound level (L_{eq}) is often used to describe the overall noise environment. L_{eq} is the average sound level in dB.

The Noise Control Act of 1972 (Public Law 92-574) directs Federal agencies to comply with applicable Federal, state, interstate, and local noise control regulations. In 1974, the USEPA provided information suggesting that continuous and long-term noise levels in excess of DNL 65 dBA are normally unacceptable for noise-sensitive land uses such as residences, schools, churches, and hospitals. The City of Manchester maintains noise regulations ordinance that does not set specific not-to-exceed noise level (City of Manchester, 2011), however, they limit the hours of construction noise to the hours from 7am to 9pm.

Existing sources of noise near and within the Facility include local road traffic, high altitude aircraft over-flights, periodic construction activities, and natural noises such as leaves rustling and birds. The Facility is less than ¼ of a mile from Interstate 93 and is approximately 7 miles north of the Manchester-Boston Regional Airport. The nearest off-site sensitive noise receptor is a suburban residential community located approximately 250 feet to the north and west of the proposed CHP plant site staging area of Parking Lot E (see Figure 1).

Table 8 shows typical sound levels associated with residential communities. Based on the adjacent residential community's density and proximity to other developed areas within the City of Manchester, this community likely has noise levels comparable to normal suburban residential to urban residential communities (43 -48 dBA average) for indoor areas.

Table 8. Typical L₉₀ Sound Levels in Residential Communities

Description	Typical Range, dBA	Average, dBA
Very Quiet Rural or Remote Area	26 to 30	28
Very Quiet Suburban or Rural Area	31 to 35	33
Quiet Suburban Residential	36 to 40	38
Normal Suburban Residential	41 to 45	43
Urban Residential	46 to 50	48
Noisy Urban Residential	51 to 55	53
Very Noisy Urban Residential	56 to 60	58

Source: USEPA, 1974

Note: L₉₀ is the noise level exceeded for 90 percent of the time. For 90 percent of the time, the noise level is above this level. It is generally considered to be representing the background or ambient level of a noise environment

In addition, the main medical center building is an onsite sensitive noise receptor, located approximately 250 feet to the south of the proposed CHP plant site. Typical noise levels for indoor hospital areas are 45 dBA on average (USEPA, 1974). Due to daily operations (existing boiler equipment, ventilation systems, truck deliveries, etc.) at the Facility, local noise levels at the project site are likely more comparable to noisy urban residential (53 dBA average).

No Action Alternative

Under the No Action Alternative, *no changes* in the ambient noise environment would occur. No construction or change in operations would be expected. Ambient noise conditions would remain unchanged when compared to existing conditions.

Preferred Action Alternative

Short-term, less-than-significant and long-term minor adverse effects on the noise environment would be expected from implementing the Proposed Action. Noise levels at the Facility, however, would not exceed ambient noise level standards as determined by the Federal, state, and/or local government. Short-term moderate increases in noise would be primarily from using heavy equipment during construction. Long-term noise from plant operations would be moderate.

The Proposed Action would require the construction of the new CHP plant within the existing Building 7 and the decommissioning of the existing Boiler 2 within Building 7. Individual pieces of construction equipment typically generate noise levels of 80 to 90 dBA at a distance of 50 feet (Table 9). With multiple items of equipment operating concurrently, noise levels can be relatively high during daytime periods at locations within several hundred feet of active construction sites. Noise from a point source (such as a piece of construction equipment) typically decreases 6 dB per doubling of distance over a paved surface and 9 dB over a vegetated surface. Using a low average decrease of 7 dB per doubling of distance, temporary noises generated from the construction equipment would be anticipated to be between 66 to 76 dBA at about 250 feet from the project construction site and would drop off to background levels (50 – 60 dBA) at about 800 feet from the project construction site.

Table 9. Noise Levels Associated with Outdoor Construction

Construction phase	dBA L_{eq} at 50 feet from source
Ground Clearing	84
Excavation, Grading	89
Foundations	78
Structural	85
Finishing	89

Source: Bolt et.al., 1971

The increase in construction noise levels would have an adverse impact on the residential communities and on the employees and patients at the adjacent main medical center building. The effects would, however, be temporary and end upon completion of construction. Given the temporary nature of the construction, the majority of construction and demolition activities occurring within Building 7, and adherence to the local noise ordinance for construction activities, this adverse impact would be a less-than-significant, short-term adverse effect.

The potential for adverse noise effects would be further reduced (lower dBA levels at nearby sensitive receptors) as most construction and demolition activities would occur within the interior of Building 7. Sound level reduction provided by different buildings differs greatly based on type of construction and climate, and on whether the building's windows are open or closed. The approximate national average for noise reduction afforded by buildings is 15 dB for structures within open windows and 25 dB for structures with closed windows (USEPA, 1978). In an open window situation, construction noise generated within Building 7 would be reduced to levels between 51 to 61 dBA at the nearest sensitive noise receptors, 250 feet from the project construction site.

Although a specific CHP system has not been identified (i.e., make/model), the VA would ensure noise emissions from the new plant equipment as measured at the property line adjacent to residential neighbors or at facilities which house patients, would not exceed 65 dBA continuous during daylight hours, or 55 dBA during evening hours 9 p.m. to 6 a.m. to comply with the USEPA's noise thresholds for annoyance.

Typical CHP systems of this size produce noise levels under 75 dBA at 3 feet from the unit. Using similar point source of noise and distance principles described for construction operations (a low average decrease of 7 dB per doubling of distance), operational noises generated from the CHP plant would be anticipated to be below 61 dBA at about 250 feet, which would be comparable to background noise levels characteristic to a very noisy urban residential environment. These increases of noise levels, however, reflect potential increases in noise conditions if the CHP system were placed external from Building 7. Using similar noise reduction levels for activities within buildings described for construction operations (a 15 dB reduction for structures with open windows), operational noise at 250 feet in distance would likely be around 46 dBA. Under this scenario, noise levels resulting from operations to nearby sensitive receptors would be comparable to background noise levels characteristic to an urban residential environment (close to existing background noise levels) and would constitute a minor to moderate adverse impact to these residential areas to the north and west bordering the Facility and to the main medical center building.

Proposed Mitigation Measures

The following measures would prevent significant adverse noise impacts due to the Proposed Action:

- In order to avoid significant adverse noise effects during construction to adjacent residential and medical center sensitive noise receptors, noise limits would be adhered to based on the City of Manchester noise regulation ordinance. For construction, this includes limiting construction noise to the hours from 7 a.m. to 9 p.m.
- Noise effects on construction and operational personnel would be limited by ensuring all personnel wear adequate personal hearing protection to limit exposure and ensure compliance with Federal health and safety regulations.
- Noise emissions from the new plant equipment as measured at the property line adjacent to residential neighbors or at facilities which house patients, would not exceed 65 dBA continuous during daylight hours, or 55 dBA during evening hours 9 p.m. to 6 a.m.

3.3.5 Solid and Hazardous Waste

The NHDES Solid Waste Compliance Assurance Section is responsible for solid waste management in the state and the NHDES Hazardous Waste Management Bureau is responsible for administering the State's hazardous waste management program. Hazardous waste activities must comply with all applicable Federal regulations under 40 CFR 260-268, 273, and 279 and 29 CFR 1910.

The Facility is located in USEPA Region 1 and operates as a Conditionally Exempt Small Quantity Generator of hazardous waste, which means the Facility generates 100 kilograms (kg) or less of hazardous waste and less than 1 kg of acutely hazardous waste per calendar month (EDR, 2011). Hazardous waste streams include fuel blends, alcohols, and formalin. These wastes are collected and hauled off site by licensed contractors for treatment, disposal, or recycling.

Currently, there are eight ASTs at the Facility. Five of these are located within the Tank Farm area located directly to the north of the proposed CHP plant site and include: two 20,000gallon No. 2 fuel oil tanks; one 1,000-gallon diesel fuel tank, one 500-gallon diesel fuel tank, and one 500-gallon gasoline tank.

Seven underground storage tanks (USTs) were formerly located behind the facility boiler plant (Building 7). Six were removed and one was closed in place. The USTs were removed or closed in 1997 and 1998. Although only one official closure letter was present in the Facility files, state records indicate all listed tanks have received formal closure from the NHDES (CHPPM, 2008). In addition, two former unpermitted landfill sites containing incinerator ash were discovered at the Facility in 1987; one along the eastern boundary of the property and the other located behind Building 7, to the northwest of the existing tank farm. Approximately 316 cubic yards of ash and soil in total was removed from these sites in 1987; subsequent analytical results indicated the material was nonhazardous (CHPPM, 2008). Within the Proposed Action footprint, however, no known hazardous waste sites are present.

Solid waste at the Facility is managed via a contract with a local solid waste disposal firm. Solid waste is transported from the Facility following a regular schedule.

No Action Alternative

Under the No Action Alternative, the Facility would continue its current operations and would generate the same types and quantities of hazardous and non-hazardous wastes. Wastes would continue to be collected and transported for offsite disposal or recycling in accordance with Federal, state, and local regulations. No changes would occur.

Preferred Action Alternative

Under the Preferred Action Alternative, short- and long-term, less-than-significant adverse effects related to solid and hazardous waste would be anticipated. Each potential effect is described below.

General Construction: During construction, there would be potential for contamination due to the increased presence and use of construction-related hazardous substances and wastes; this would be short-term, less-than-significant adverse impact. A small increase in construction vehicle traffic would increase the likelihood for release of vehicle operating fluids (e.g., oil, diesel, gasoline, antifreeze, etc.) and maintenance materials. The VA would implement standard construction best management practices (BMPs) such as maintaining equipment and keeping spill kits on hand to ensure these potential effects are minimized. Construction of the CHP plant would generate nominal amounts of solid waste typical of construction projects (i.e., miscellaneous building supplies (scrap wood and scrap metal) and fuel and oil to operate and maintain construction equipment while used onsite). These wastes would be managed in accordance with Federal and state regulations.

Decommissioning: The Proposed Action would include the decommissioning of the existing Boiler 2 within the current heating plant (Building 7). As the VA would conduct this activity in accordance with all applicable Federal, state, and local requirements, and would recycle materials to the maximum extent possible, no adverse effects would be anticipated.

Operation of Proposed Heating Plant: Proposed operations at the new CHP plant would require additional quantities of raw materials from what the facility is currently using; however, these materials would be similar to what is currently used onsite. No USTs or ASTs are proposed.

Proposed operations of the new CHP plant would generate limited amounts of waste. Natural gas and water entering the system would be converted to steam; air emissions from the unit would be the main "waste" generated (see Section 3.1.1). Limited/negligible streams of oil and grease waste and solid wastes would be produced during equipment maintenance. The facility is currently regulated as a Conditionally Exempt Small Quantity Generator of hazardous waste. Operational waste generation is not anticipated to change the Facility's generator status. Any hazardous waste generated would be managed through the VA's established hazardous waste program. Similarly, the operation of the CHP system may generate small amounts of non-hazardous waste from maintenance and cleaning of the system. The handling and storage of non-hazardous waste would be similar to current operations, namely, the waste would be collected in containers for offsite disposal or for recycling.

Operation of the proposed heating plant would also include new, more efficient systems that would require less maintenance. This would result in a decrease in the amount of solid and hazardous wastes generated from operation and maintenance activities and would be a long-term, positive effect. The VA would continue to conduct operations in accordance with all applicable local, state, and Federal requirements concerning solid and hazardous waste.

Proposed Mitigation Measures

No mitigation measures are required. As described above, the VA would implement BMPs during construction and operation and would comply with Federal and state regulations to minimize effects in this resource area.

3.4 Cumulative Effects

Cumulative impacts, as defined by the CEQ, are, "Impacts on the environment, which result from the incremental impact of the action when added to other past, present, and reasonable foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such action" (40 CFR 1508.7). Thus, cumulative impacts are the sum of all direct and indirect impacts, both adverse and positive, that result from the Proposed Action when combined with past, present, and future actions regardless of the source. Cumulative impacts may be accrued over time and/or in conjunction with other pre-existing effects from other activities in the area (40 CFR 1508.25); therefore, pre-existing impacts and multiple smaller impacts should also be considered. For the purpose of this analysis, the ROI regarding cumulative impacts includes the Facility property and adjacent bordering areas.

The only project identified for cumulative impact analysis occurring within the ROI is the proposed Building 1 Expansion. This expansion includes construction of a 12,000 square-foot mental health care facility addition to the western face of Building 1. A specific timeline for this expansion is not known at this time.

The Proposed Action would not result in significant adverse cumulative effects, as described below for each Technical Resource Area analyzed in this EA:

Air Quality/Greenhouse Gases: The State of New Hampshire takes into account the effects of all past, present, and reasonably foreseeable emissions during the development of the SIP. The state accounts for all significant stationary, area, and mobile emissions sources in the development of this plan. Estimated emissions generated by the Preferred Action Alternative would be either *de minimis* or completely offset. It is not anticipated that the Preferred Action Alternative would interfere with the timely attainment of the NAAQS in this region. Therefore, the Preferred Action Alternative in combination with the future building expansion would not contribute significantly to adverse cumulative effects to air quality.

Utilities: The Proposed Action would result in long-term positive effects to onsite and regional utilities through provision of a CHP plant. During construction, the VA would ensure short-term effects to utilities are minimized. As such, no cumulative adverse effects to utilities are anticipated. The proposed addition to Building 1 would likely cause an increase in demand for utilities at the Facility; however, the Proposed Action of this EA is not anticipated to produce adverse significant cumulative impacts to utilities in conjunction with the proposed addition.

Cultural Resources: The Proposed Action would not have adverse effects to historic architectural, archaeological, or tribal resources. Through ongoing consultation with the

SHPO for existing and future proposed projects at the Facility, the VA would ensure adverse effects to such resources are avoided or minimized. Furthermore, the proposed expansion of Building 1 is currently being coordinated by the VA with the SHPO to ensure adverse effects to cultural resources are minimized. As such, no cumulative significant adverse effects to cultural resources are anticipated.

Noise: The Proposed Action would introduce short-term incremental increases in the noise environment. These changes would be less-than-significant, temporary, and have negligible cumulative effects. Long-term potentially moderate adverse changes would occur to the local noise environment from operations of the CHP plant. Although the proposed addition to Building 1 would create temporary adverse noise impacts during construction, operations of the CHP plant in combination with the proposed building addition would not be anticipated to generate adverse significant cumulative effects to the noise environment.

Solid and Hazardous Waste: The Proposed Action would not result in significant adverse effects to solid and/or hazardous waste generation, use, storage, or transportation. Long-term positive impacts would be anticipated through the development and use of a new, modern heating plant and associated infrastructure. Solid and hazardous waste volumes generated by the Facility would not change substantially under the Proposed Action; existing methods and means would be sufficient to handle any incremental additional requirements. As such, no cumulative adverse impacts are anticipated. Although the proposed addition to Building 1 would likely generate additional amounts of waste during construction and operations, the CHP plant in combination with the proposed building addition would not be anticipated to generate adverse significant cumulative effects to solid and hazardous waste.

No adverse cumulative effects would be anticipated under the No Action Alternative.

SECTION 4: REFERENCES

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SECTION 5: AGENCIES AND INDIVIDUALS CONSULTED

US FISH AND WILDLIFE SERVICE – NEW ENGLAND FIELD OFFICE

Endangered Species Consultation Website.

http://www.fws.gov/newengland/EndangeredSpec-Consultation_Project_Review.htm

NEW HAMPSHIRE DIVISION OF FORESTS AND LANDS NATURAL HERITAGE BUREAU

Natural Heritage Bureau DataCheck Tool website.

https://www2.des.state.nh.us/nhb_datacheck/

NEW HAMPSHIRE DIVISION OF HISTORICAL RESOURCES (STATE HISTORIC PRESERVATION OFFICE - SHPO)

Ms. Elizabeth H. Muzzey, Director and State Historic Preservation Officer
NH Division of Historical Resources
State Historic Preservation Office
Attention: Review & Compliance
19 Pillsbury Street
Concord, NH 03301-357

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MA Historical Studies and Public History

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Year Experience: 14

EA Role: Cultural Resources Author

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Role: Air Quality Technical Expert/Resource Author

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B.S. Natural Resources

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Role: Project Manager/Resource Author

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Years Experience: 8

Role: GIS Analyst

Spangenberg, Rachel

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Whipple, Brian

M.S. Information Science

B.S. Environmental. Engineering

Year Exp: 17

Role: Program Manager/QA Reviewer

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APPENDIX A

CONSULTATION DOCUMENTS



New Hampshire Natural Heritage Bureau

To: Robert Naumann
Potomac-Hudson Engineering
7830 Old Georgetown Road
Suite 220
Bethesda, MD 20814

Date: 5/12/2011

From: NH Natural Heritage Bureau

Re: Review by NH Natural Heritage Bureau of request dated 5/12/2011

NHB File ID: NHB11-0995 Applicant: Department of Veterans Affairs

Address: 718 Smyth Road
Manchester

Project Categories:
Buildings and Related Structures: Single commercial building lot

The NH Natural Heritage database has been checked for records of rare species and exemplary natural communities near the area mapped below. The species considered include those listed as Threatened or Endangered by either the state of New Hampshire or the federal government. We currently have no recorded occurrences for sensitive species near this project area.

A negative result (no record in our database) does not mean that a sensitive species is not present. Our data can only tell you of known occurrences, based on information gathered by qualified biologists and reported to our office. However, many areas have never been surveyed, or have only been surveyed for certain species. An on-site survey would provide better information on what species and communities are indeed present

This review is valid through 5/11/2012.

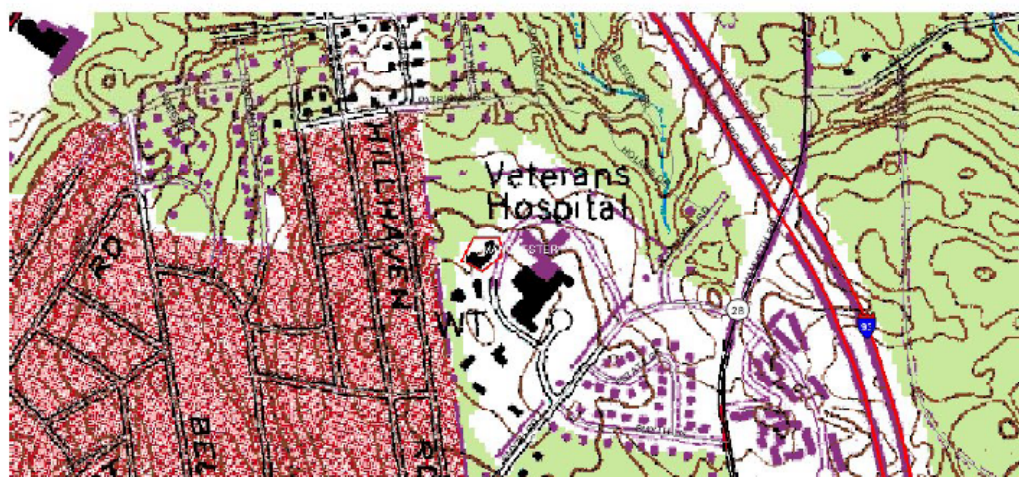
Department of Resources and Economic Development
Division of Forests and Lands
(603) 271-2214 fax: 271-6488

DRED/NHB
PO Box 1856
Concord NH 03302-1856



New Hampshire Natural Heritage Bureau

MAP OF PROJECT BOUNDARIES FOR: NHB ID#NHB11-0995



Department of Resources and Economic Development
Division of Forests and Lands
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DRED/NHB
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United States Department of the Interior

FISH AND WILDLIFE SERVICE

New England Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5087
<http://www.fws.gov/newengland>



January 3, 2011

To Whom It May Concern:

This project was reviewed for the presence of federally-listed or proposed, threatened or endangered species or critical habitat per instructions provided on the U.S. Fish and Wildlife Service's New England Field Office website:

(<http://www.fws.gov/newengland/EndangeredSpec-Consultation.htm>)

Based on the information currently available, no federally-listed or proposed, threatened or endangered species or critical habitat under the jurisdiction of the U.S. Fish and Wildlife Service (Service) are known to occur in the project area(s). Preparation of a Biological Assessment or further consultation with us under section 7 of the Endangered Species Act is not required.

This concludes the review of listed species and critical habitat in the project location(s) and environs referenced above. No further Endangered Species Act coordination of this type is necessary for a period of one year from the date of this letter, unless additional information on listed or proposed species becomes available.

Thank you for your cooperation. Please contact Mr. Anthony Tur of this office at 603-223-2541 if we can be of further assistance.

Sincerely yours,

Thomas R. Chapman
Supervisor
New England Field Office

APPENDIX B

VA ENVIRONMENTAL ASSESSMENT SUMMARY CHECKLIST

ENVIRONMENTAL ASSESSMENT SUMMARY (CHECKLIST) DEPARTMENT OF VETERANS AFFAIRS

VA FACILITY: Manchester VAMC, Hillsborough County, New Hampshire

PROJECT NO.: _____

PROJECT TITLE: Proposed Combined Heat and Power (CHP) Plant

ASSESSED BY: PHE, Inc.

STAFF RECOMMENDATION DATE: DATE OF EA

RECOMMENDATION:

- ☐ DEFER ACTION
☒ EA COMPLETE (FONSI)
☐ SUPPLEMENTAL EA REQUIRED
☐ EIS REQUIRED

CHECKLIST FOR Preferred Action Alternative

IMPACTS ATTRIBUTES

KEY: S = SEVERE MI = MINIMAL M = MODERATE N = NONE

S	M	MI	N	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	AESTHETICS
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	AIR QUALITY (proposed emissions, heating plant)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	AVIATION/RADAR
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	COMMUNITY SERVICES
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	CULTURAL RESOURCES
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	ECONOMIC ACTIVITY (positive effects only)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	FLOODPLAINS, WETLANDS, COASTAL ZONE, ETC.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	GEOLOGY AND SOILS
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	HISTORIC (onsite potential NRHP-eligible historic district)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	HYDROLOGY AND WATER QUALITY
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	LAND USE
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NOISE (primarily temporary in nature due to construction)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	POTENTIAL FOR GENERATING SUBSTANTIAL CONTROVERSY
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	REAL PROPERTY
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	RESIDENT POPULATION
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SOLID/HAZARDOUS WASTE (waste generation)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	TRANSPORTATION AND PARKING
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	UTILITIES (primarily positive impacts)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	VEGETATION AND WILDLIFE
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	VISUAL RESOURCES
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	US ENVIRONMENTAL REGULATIONS (CAA; Section 106, Noise Control Act)

APPENDIX C

PUBLIC NOTICES AND COMMENTS

PLACEHOLDER TO BE COMPLETED FOLLOWING PUBLIC COMMENT

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APPENDIX D

AIR EMISSION CALCULATIONS

Table D-1 Estimated Emission from Reciprocating Generators								
		Emission Factor (lbs/MMBtu), From AP-42 Section 3.2 Natural Gas-fired Reciprocating Engines - Table 3.2-2						
		CO	NO_x	VOC	SO_x	PM₁₀	PM_{2.5}	CO₂
		0.317	4.08	0.118	5.88E-04	7.71E-05	7.71E-05	110
	Annual Natural Gas Usage	Annual Emissions (tpy)						
	(MMBtu)	CO	NO_x	VOC	SO_x	PM₁₀	PM_{2.5}	CO₂
Uncontrolled								
Actual Emissions	55,844	8.85	113.92	3.29	0.02	<0.01	<0.01	3,071
Potential-to-Emit	59,951	9.50	122.30	3.54	0.02	<0.01	<0.01	3,297
With Selective Catalytic Reduction (SCR)								
Actual Emissions	55,844	8.85	17.09	3.29	0.02	<0.01	<0.01	3,071
Potential-to-Emit	59,951	9.50	18.34	3.54	0.02	<0.01	<0.01	3,297

Note: Assumes 4-Stroke Lean Burn Engine.

Table D-2 Estimated Emission from Supplemental Steam Boilers						
Total Annual Heat Required	210,817	MMBtu/year				
Total Consumption	207	MMcf/year				
	CO	NO_x	VOC	SO_x	PM₁₀	PM_{2.5}
Emission Factors (lb/10 ⁶ cf) ¹	84	190	5.5	0.6	7.6	7.6
Actual Emissions	8.68	19.63	0.57	0.06	0.79	0.79

1. Natural gas emission factors were obtained from U.S. EPA's AP-42, Section 1.4.

APPENDIX E

RELEVANT CULTURAL RESOURCES DATA

ATTACHMENT C

Note: This is a sample information sheet only and not meant to be an exhaustive or complete list of all attributes that need to be included.

INFORMATION CONCERNING HISTORIC PRESERVATION

	<u>YES</u>	<u>NO</u>
Is this property on the National Register of Historic Places?	_____	<u>X</u>
Is this property on the official listing of properties eligible for the National Register of Historic Places?	_____	<u>X</u>
Is this property on the State Inventory of Historic Property? NHDHR INVENTORY# MAN 0484	<u>X</u>	_____
Has this property been surveyed	<u>X</u>	_____
- By the state	_____	<u>X</u>
- By the holding agency if federal property	_____	<u>X</u>
Did the survey include archaeology?	_____	<u>X</u>
Are any nearby properties on the National Register of Historic Places?	<u>X</u>	_____
Is any nearby property on the State inventory?	_____	<u>X</u>
Has the State surveyed the nearby properties?	_____	<u>X</u>
If any nearby property is Federally owned, has the holding agency surveyed the property?	_____	<u>X</u>
Does the State Archaeologist have any registered sites on any nearby property?	_____	<u>X</u>
For all buildings to be demolished:		
- approximate age	_____	<u>NA</u>
- uses	_____	_____
- exact number of buildings	_____	_____
For cemeteries:		
- are remains still there or have they been moved?	_____	<u>NA</u>
(This is especially important for former military posts.)		
For all military posts: date established _____	<u>NA</u>	